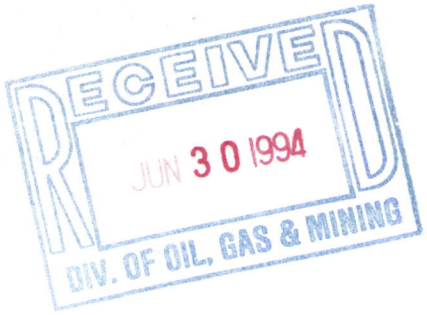
Form MR-SMO
(Revised 1/92)



This Section for DOGM Use:
-Assigned DOGM File No.: S /027 /053
DOGM Lead: ANTHONY A. GALLEGOS

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340
Fax: (801) 359-3940

SUPERSEDED
MAY 24 2010
Div. of Oil, Gas & Mining

NOTICE OF INTENTION TO COMMENCE SMALL MINING OPERATIONS

The informational requirements of this form are based on provisions of the Mined Land Reclamation Act, Title 40-8, Utah Code Annotated 1987, and the General Rules as promulgated under the Utah Minerals Regulatory Program.

"Small Mining Operations" means mining operations which disturb five or less surface acres at any given time.

* * * * * * * * *

I. GENERAL INFORMATION (Rule R647-3-104)

1. Name of Claim/Mine: ML 982 and ML 43854

2. Name of Operator/Applicant: ROBERT M. ROBISON
Company ( ) Corporation ( ) Partnership ( ) Individual (X)

3. Permanent Address: 690 E MARTINDALE LANE
City: FILLMORE State: UTAH Zip Code: 84631
Telephone Number: (801) 743-7005

4. Ownership of Land Surface:

Private (Fee) ☐ Public Domain (BLM) ☐ National Forest (USFS) ☐
State of Utah ☐ Other: PRIVATE

5. Ownership of Minerals:

Private (Fee) ☐ Public Domain (BLM) ☐ National Forest (USFS) ☐
State of Utah ☒ Other:

Utah Mining Claim Number(s): N/A

Utah State Lease Number(s): ML 982 and ML 43854

6. Have the above owners been notified in writing? Yes ____ No X
If no, why not? Telephone conversations
HAD MEETING WITH JOHN BLAKE, STATE LANDS & FORESTRY 6/30/94 AM - aag

7. Does the operator have legal right to enter and conduct mining operations on the land covered by this notice? Yes X No ____

II. PROJECT LOCATION & MAP (Rule R647-3-105)

1. Project Location (legal description):
County(ies): Millard

E 1/2, of E 1/2: Section: 35 Township: 22 S Range: 6 W SLB&M
LOT 9 & LOT 10 : Section: 2 Township: 23 S Range: 6 W SLB&M
____ 1/4, of ____ 1/4, of ____ 1/4: Section: ____ Township: ____ Range: ____

2. A topographic base map showing the location of the proposed small mining operation must be submitted with this notice. A USGS 7.5 minute series map is preferred. The areas to be disturbed should be plotted in sufficient detail so that they can be located on the ground. It is recommended that the operator also plot and label any previous disturbances in the immediate vicinity that he is not responsible for.

III. OPERATION PLAN (Rule R647-3-106)

1. Type of mining: Surface ☒ Underground ☐

2. Mineral(s) to be mined: Limestone

3. Provide a brief description of the proposed mining operation and onsite processing facilities. Planned mining methods include: excavation by backhoe and tractor, rubber tires or tracks; shallow drilling and blasting with "anfo" (prill). A crushing and screening plant may also be used.

New Road(s): Length NONE aag (ft) Width ____ (ft)

Total project surface acreage to be disturbed: 40 (acres) (estimate) OVER THE LIFE OF THE MINE.

MINING DISTURBANCE TO BE LIMITED TO 5 ACRES OR LESS ACCORDING TO D.O.G.M. RULES. as per discussion with operator 6/30/94 aag.

SUPERSEDED
MAY 24 2010
Div. of Oil, Gas & Mining

IV. OPERATION AND RECLAMATION PRACTICES (Rule R647-3-107, 108 & 109)

The reclamation and operation obligation is to keep the area clean and safe, minimize hazards to public safety, return the land to a useful condition, and reestablish at least 70 percent of the premining vegetative ground cover. To accomplish this, the operator will need to perform reclamation concurrently, or at the completion (within one (1) year) of mining:

1. Keep the mining operation in a safe, clean, and environmentally stable condition.
2. Permanently seal all shafts and tunnels to prevent unauthorized or accidental entry.
3. Plug drill holes with a five foot cement surface plug. Holes that encounter fluids are to be plugged in the subsurface to prevent aquifer contamination.
4. Construct berms, fences, or barriers, when needed, above highwalls and excavations.
5. Remove, isolate, or neutralize all toxic materials in a manner compatible with federal and state regulations.
6. Remove all waste or debris from stream channels.
7. Dispose of any trash, scrap metal, wood, machinery, and buildings.
8. Conduct mining activities so as to minimize erosion and control sediment.
9. Reclaim all roads that are not part of a permanent transportation system.
10. Stockpile topsoil and suitable overburden prior to mining.
11. Stabilize highwalls by backfilling or rounding to 45 degrees or less, where feasible; reshape the land to near its original contour, and redistribute the topsoil and suitable overburden.
12. Properly prepare seedbed to a depth of six inches by ripping, discing, or harrowing.
13. Reseed disturbed areas with adaptable species. (The Division recommends seeding 20 lbs./acre of native and introduced species of grass, forb, and browse seed, and will provide a specific species list if requested.)
14. Plant the seed with a rangeland or farm drill, or if broadcast seeded, harrow or rake the seed 1/4-1/2 inch into the soil - fall is the preferred time to seed.

V. VARIANCE REQUEST (Rule R647-3-110)

Yes ☐ No ☒ PROPOSED MINING IS WITHIN AN AREA OF EXISTING DISTURBANCE (SEE ATTACHED MAP). OPERATOR WILL BE PROVIDING PHOTOS OF EXISTING DISTURBANCES WITHIN NEXT 2-3 WEEKS. RMR

Any planned deviations from Rules R647-3-107, Operation Practices, R647-3-108, Hole Plugging Requirements, or R647-3-109, Reclamation Practices, as summarized above, should be identified below and justification given for the variance request(s).

Item Number	Variance Request Justification

VI. SIGNATURE REQUIREMENT

I hereby commit to conduct mining operations and to reclaim the aforementioned small mine as required by the Utah Mined Land Reclamation Act (40-8) and the rules as specified by the Board of Oil, Gas and Mining.

Signature of Operator/Applicant: Robert M Robison

Name (typed or printed): ROBERT M. ROBISON

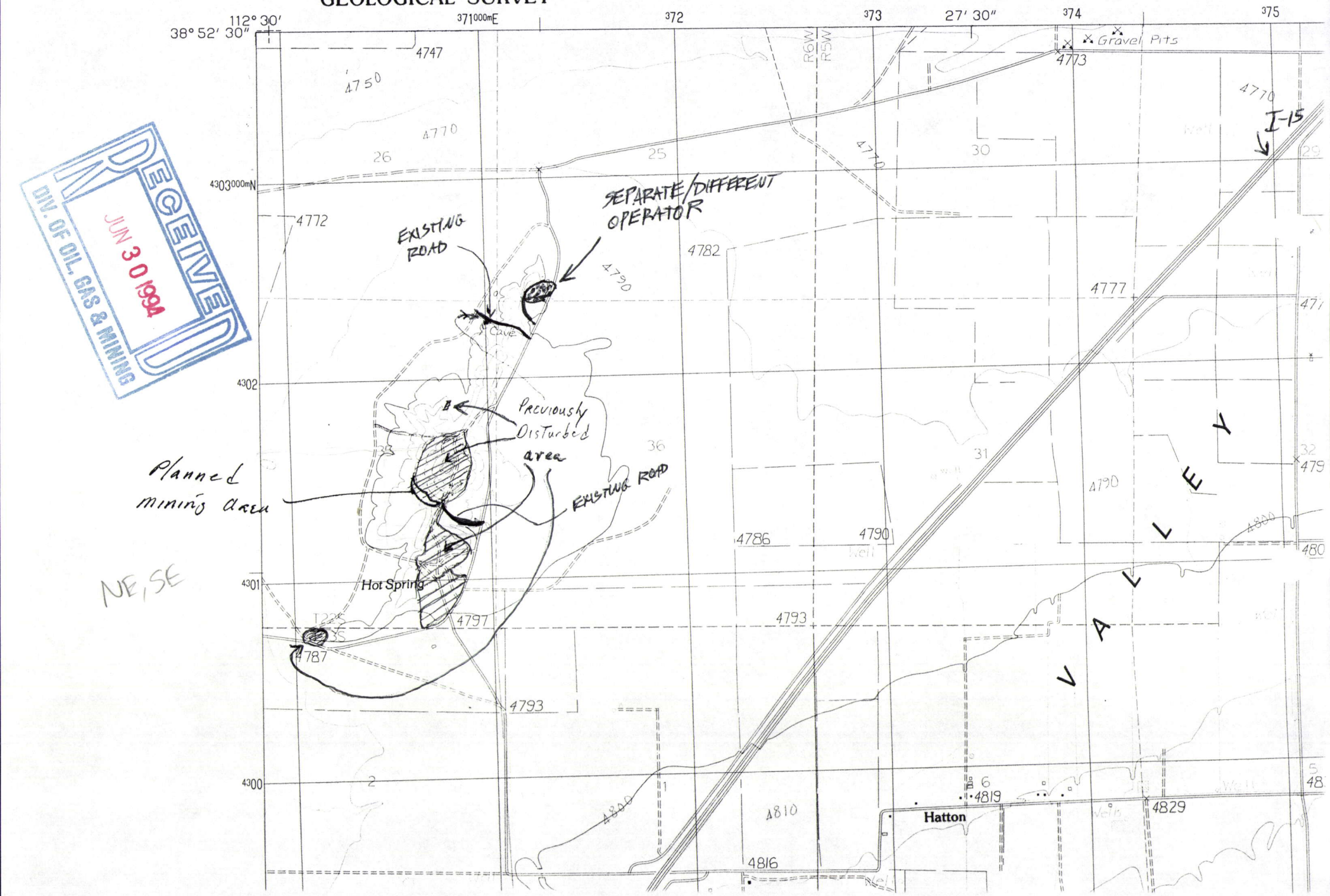
Title/Position (if applicable): LESSEE

Date: 30 MAY, 1994

3:MR-SMO

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

KANOSH QUAD S/027/053



NE, SE

United States Department of Agriculture
Soil Conservation Service
P. O. Box 534
Richfield, UT 84701

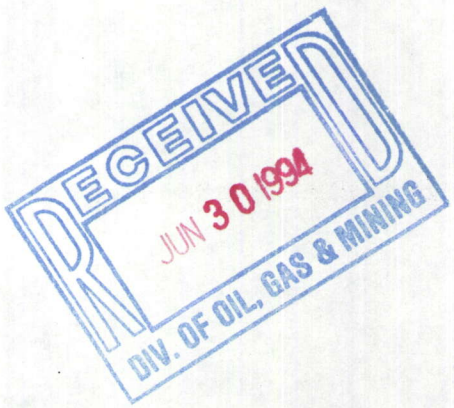
May 23, 1994

Bob Robison
690 East Martindale Lane
Fillmore, UT 84631

I have reviewed the soils and range site information on the mining claim we discussed. The soil is a complex of Kersick and rock outcrop. The range site is a semidesert shallow loam. I have enclosed copies of these descriptions.

Our general recommendation for revegetating mined land in this area is enclosed. Based on my personal experience I recommend planting 6 to 8 pounds of 'Hycrest' crested wheatgrass and .5 pounds of 'Immigrant' forage kochia. Both seeding rate are based on a pure live seed basis (purity X germination = Pure Live Seed). If at all possible the area should be planted with a drill. Seeding rates will be considerably higher if broadcast seeding is used.

If I may be of further service let me know.



Blake Walbeck
Range Conservationist

$B39KRE=Kersick-Rock outcrop complex, 5 to 20 percent slopes<EP>
<EP>
$B45Setting$B46<EP>
$B27Position on landscape:$B28 ridges and hillslopes<EP>
$B27Elevation:$B28 4800 to 5000 feet<EP>
$B27Average annual precipitation:$B28 About 12 to 13 inches<EP>
$B27Average annual air temperature:$B28 About 48 to 52 degrees F<EP>
$B27Frost-free period:$B28 About 100 to 140 days<EP>
<EP>
$B45Composition$B46<EP>
$B25Kersick soil and similar inclusions: 65 percent<EP>
$B26Rock outcrop: 25 percent<EP>
$B26Contrasting inclusions: 10 percent<EP>
<EP>
$B45Characteristics of the Kersick Soil$B46<EP>
$B27Position on landscape:$B28 minerally developed hills and ridges<EP>
$B27Slope range: 5 to 20 percent<EP>
$B27Shape of slopes: convex to concave<EP>
$B27Present vegetation:$B28 grasses, forbs and some shrubs<EP>
$B27Rock fragments on the surface:$B28 Kind=gravel and cobbles; percentage of surface covered=20<EP>
$B27Typical profile:<EP>
$B270 to 3 inches=pale brown gravelly loam<EP>
$B263 to 7 inches=pale brown cobbly loam<EP>
$B267 to 14 inches=light yellowish brown gravelly loam<EP>
$B2614 inches=travertine limestone bedrock<EP>
$B27Depth to bedrock:$B28 10 to 20 inches<EP>
$B27Depth class:$B28 shallow (10 to 20 inches)<EP>
$B27Drainage class:$B28 well<EP>
$B27Parent material:$B28 Kind=residuum; source=travertine<EP>
$B27Permeability:$B28 moderate<EP>
$B27Available water capacity:$B28 very low (1 to 2 inches)<EP>
$B27Water-supplying capacity:$B28 1 to 3 inches<EP>
$B27Potential rooting depth:$B28 10 to 20 inches<EP>
$B27Runoff:$B28 very rapid<EP>
$B27Hazard of water erosion:$B28 high to very high<EP>
$B27Hazard of wind erosion:$B28 none to slight<EP>
<EP>
$B45Included Areas$B46<EP>
$B27Contrasting inclusions:$B28<EP>
$B29soils that are more than 20 inches to bedrock<EP>
$B29soils with more than 35 percent rock fragments<EP>
$B29soils that are fine sandy loam and sandy loam throughout the profile<EP>
$B38$B27Similar inclusions:$B28<EP>
$B29soils with less than 40 percent calcium carbonate equivalent<EP>
<EP>
$B45Major Uses$B46<EP>
$B25rangeland and quarry<EP>
<EP>
$B45Major Management Factors$B46<EP>

KRE pg 2

$B38$B42Soil-related factors:$B39<EP>
$B37Kersick soil=available water capacity, gravel and cobbles on the surface, depth to bedrock, slope, water erosion, rock outcropping<EP>
$B38$B42Rangeland$B38<EP>
$B27Composition of potential plant community:<EP>
$B37Kersick soil=45 percent grasses, 5 percent forbs, 50 percent shrubs<EP>
$B27Dominant vegetation in potential plant community:<EP>
$B37Kersick soil=bluebunch wheatgrass, cheatgrass, black sagebrush, shadscale Indian ricegrass<EP>
$B27General management considerations:$B28<EP>
$B29Suitability for range seeding is poor
$B29The main limitations are low available water capacity and depth to bedrock
$B29Because of low water holding capacity and depth to bedrock, management practices are rated poor for range seeding.<EP>
$B29*<EP>
<EP>
$B45Interpretive Groups$B46<EP>
$B27Capability subclass:<EP>
$B37Kersick soil=VIIs, nonirrigated<EP>
$B26Rock outcrop=VIII, nonirrigated<EP>
$B27Range site:<EP>
$B37Kersick soil=Semidesert Shallow Loam (Black sagebrush)<EP>
$B26Rock outcrop=no range site assigned<EP>

ROADSIDES, CONSTRUCTION SITES, MINE SITES, AND SPOILS (Continued):

Table 7. Salt Desert Shrub (8 to 10 inches average annual precipitation (AAP)).

	LBS. PLS/ACRE[1] All soils		
Species	A[2]	B	C
Crested wheatgrass	6	8	8
Russian wildrye	6		
Thickspike wheatgrass		3	3
Streambank wheatgrass	3		
Indian ricegrass		3	
Lewis flax	1	1	1
Palmer penstemon	1	1	1
Fourwing saltbush	2	2	2
Forage kochia	3	3	3

Substitute species (see Appendix B for recommended seeding rates):
a. Grasses: (On bottomland or fill disturbances only: Basin wildrye, tall wheatgrass), bottlebrush squirreltail, sand dropseed, alkali sacaton, Sandberg bluegrass, galleta. Sandy soils: Indian ricegrass.
b. Shrubs: Forage kochia, winterfat, fourwing saltbush, shadscale, rubber rabbitbrush.

[1]Rates for broadcast seeding, followed by dragging with a light harrow or other equipment to cover seed. Target rate is about 50-100 seeds/sq. ft. with mixes. Drilling is preferred. If drilled, cut rates by 1/4 to 1/2.
[2]A,B,C,...etc. Seeding rates for blends of grasses, legumes, forbs or shrubs. Use the same total seeding rate in the table if substitute species are used. Always read the table from top to bottom; do not read across designations.

Table 8. Mohave Desert Range and Basin Range (8 to 11 inches average annual precipitation).

	LBS. PLS/ACRE[1]								
	Moderately deep to deep, loamy soils			Clayey soils			Shallow, sandy and/or very gravelly soils		
Species	S[2]	A[3]	B	S[2]	A[3]	B	S[2]	A[3]	B
Crested wheatgrass	12	10	10	12	8	8	12	8	5
Western wheatgrass		4			4	4		4	
Sideoats Grama		1	2		1	1		2	1
Bluegrama		1	3		2	1		1	2
Galleta		1	2		1	2		1	2
Palmer penstemon		1	1		1	1		1	1

Substitute species (see Appendix B for recommended seeding rates):
a. Grasses: Sandy soils: Indian ricegrass
b. Shrubs: Desert bitterbrush, winterfat, fourwing saltbush, desert peach.

[1]Rates for broadcast seeding, followed by dragging with a light harrow or other equipment to cover seed. Target rate is about 50-100 seeds/sq. ft. with mixes. Drilling is preferred. If drilled, cut rates by 1/4 to 1/2.
[2]This is the seeding rate for a single grass species planted with legumes and forbs. Plant the same total amount if the grass is planted with legumes, forbs, or shrubs from the list of substitute species (e.g. if the recommended table rate is 8 lbs/acre of a grass, plus 1 lb/acre of a legume; if 1 lb/ac of a substitute species is selected, the total seeding rate is still 9 lbs/ac). Generally, seedings of single grass species are not recommended.
[3]A,B,C,...etc. Seeding rates for blends of grasses, legumes, forbs or shrubs. Use the same total seeding rate in the table if substitute species are used. (See the example footnote 1.) Always read the table from top to bottom; do not read across designations.

NOTE: Seeding in this ecosystem can be very difficult, precipitation is low and unpredictable.

standard at higher elevations. Planting depth 1/4 to 1/2 inch. Adapted varieties are "fairway" and "Ephraim."

"Ephraim" is a recently released tetraploid variety of A. cristatum that is rhizomatous. It appears to offer good possibilities for erosion control on adapted areas receiving increased moisture.

Wheatgrass, crested--hybrid (Hybrid)

A hybrid between standard and induced tetraploid fairway crested wheatgrass. Seedlings are very vigorous during germination and early establishment. Survives under greater competition and lower precipitation, yields 15-20% more forage than parents but is more stemmy than other crested wheatgrasses. It is an outstanding seed producer. Occupies same sites as standard and fairway crested. Especially useful in drier sagebrush, downy brome sites. Has established and survived in areas receiving 6 to 8 inches of precipitation. Planting depth 1/4 to 1/2 inch. The only cultivar is "Hycrest."

Wheatgrass, crested--Siberian (Introduced)

Similar to standard crested wheatgrass. It is awnless, has finer leaves and retains its greenness and palatability later into the summer than other crested wheatgrasses. However, it yields less, and has poorer seedling vigor than most crested cultivars. It occupies sites where standard crested wheatgrass will grow, and is especially useful on pinyon-juniper sites and sandier soils. Once established, it is reported to be well adapted to light, droughty soils. Planting depth 1/4 to 1/2 inch. Adapted variety is "P-27."

Wheatgrass, crested--standard (Introduced)

A very long-lived, drought tolerant bunch-grass adapted to a wide range of ecological sites and zones receiving as little as 8-10 inches of precipitation. Growth begins early in the spring and re-occurs with fall moisture. Palatability is excellent in the spring and late fall, but it is unpalatable during summer dormancy and after seed formation. It has very vigorous seedlings. Adapted to foothills receiving 10 to 15 inches of precipitation and sagebrush, ponderosa pine, mountainbrush, and juniper-pinyon ranges. Expect low vigor and poor stands above 6500 feet elevation in Northern Utah. Planting depth 1/4 to 1/2 inch. Adapted variety is "Nordan."

Wheatgrass, intermediate (Introduced)

A mild sod-forming, late maturing, long lived grass suited for use as hay and pasture, alone or with alfalfa. Begins growth early in the spring, and remains green and palatable into the summer, producing large amounts of quality forage. It does not produce mature seed at high elevations, but spreads vegetatively. Recommended from intermediate sagebrush sites into the high mountains up to 9000 feet, and on dry meadows, receiving 14 to 18 inches of precipitation. Useful on disturbed sites for soil stabilization. It is moderately shade tolerant. Planting depth 1/4 to 1/2 inch. Adapted varieties are: "Greenar" selected for forage production and compatibility with alfalfa; "Oahe" improved for seed production, forage yield, and rust resistance; and "Tegmar" which is a low-growing cultivar noted for erosion control, sod-formation and seedling vigor.

Wheatgrass, pubescent (Introduced)

A long-lived aggressive sod-former adapted to low-fertility sites and fine-textured soils. Similar to intermediate wheatgrass, but somewhat more drought-resistant, alkali tolerant, and less palatable. Is better adapted for pasture than for hay. Its ability to remain green during the summer when soil moisture is limited is a significant advantage.

Adapted to foothills receiving 12 to 16 inches of precipitation. It is suited to areas from intermediate sagebrush sites into the high mountains, but not to meadows and shady areas. Very useful for erosion control on a wide range of sites. Suggested varieties are "Luna," most commonly used in Utah, and most drought tolerant of pubescent varieties. Other varieties include "Mandan," "Topar," and "Greenleaf."

Wheatgrass, slender (Native)

This is a short-lived bunchgrass with good seedling vigor and moderate palatability. It is valuable in erosion-control seed mixes because of its rapid development, salt tolerance, and compatibility with other species. It tolerates a wide range of conditions and adapts well to high altitude ranges and more favorable sites on mountain-brush areas. Excellent in aspen and tall mountain brush. Recommended planting depth is 1/2 to 3/4 inch. "Revenue" is a Canadian variety, selected for salinity tolerance, seed set, and forage yield. "San Luis" is a newly released variety adapted to high elevations. "Pryor" has demonstrated good salinity and drought tolerance.

Wheatgrass, Snake River (Native)

A subspecies of thickspike wheatgrass that is similar to bluebunch wheatgrass. It is adaptable to most areas suitable for bluebunch; but is more vigorous and productive. (See bluebunch wheatgrass.) The only variety is "Secar."

Wheatgrass, streambank (Native)

A long-lived, drought-tolerant, creeping sod-former adapted to fine and medium textured soils. Has excellent seedling vigor and is particularly well

Recommended for use in game range revegetation mixtures in sagebrush, mountain brush, and juniper-pinyon types. The spreading habit, fire tolerance, and flowers makes this species potentially useful in seedings or plantings to stabilize disturbed soils and for roadside beautification.

Chokecherry (Native)

A shrub common in moist sites like drainages, ditches, and road shoulders and in cool and moist foothill, montane, and canyon habitats receiving 12 to more than 30 inches of precipitation. Adapted to a wide range of soil textures except dense clay; it does not tolerate poor drainage, prolonged spring flooding and high water tables. More common in silty or sandy soils with good depth, fertility, and drainage. It tolerates moderately acidic, moderately basic, and weakly saline soils. Its roots and suckers sprout aggressively after fire and it is moderately tolerant of grazing. Livestock and big game make extensive use of this shrub. Has good potential on disturbed sites as an ornamental and as a windbreak species. It can be transplanted and broadcast or drill seeded. Place seed about 1/2 inch deep. Fall seeding is preferred.

Cliffrose (Native)

Cliffrose or Stansbury cliffrose is a broadleaf evergreen that often grows as high as 20 feet, even on severe sites. It grows as dominant stands intermixed with pinyon-juniper, and is widely distributed on favorable sites in the salt-desert shrub, big sagebrush, and black sagebrush types. It is found on south and west exposures throughout the mountain brush types. It is well adapted to shallow rocky soils. It provides important high-quality winter forage to game and livestock, although usually less palatable than antelope bitterbrush. Mature plants are killed by chaining, mechanical tillage, and burning, although younger multistemmed plants are better able to recover. Small seedlings can be suppressed by annual or perennial herbs. However, once seedlings become well established they are extremely persistent to drought and competition. This shrub hybridizes with antelope bitterbrush and some highly useful populations have developed that express very useful traits. It can be successfully seeded even on harsh sites, however, it should not be seeded directly with competitive herbs. It is one of the principal shrubs currently seeded in wildlife habitat improvement projects. Under natural conditions it spreads by new seedlings; however the invasion of cheatgrass into areas occupied by this shrub has significantly reduced shrub seedling survival.

Current, golden (Native)

Golden current is a fast growing shrub that under favorable conditions may reach a height of 10 feet. It grows in several forms and produces considerable foliage. It is best suited to areas receiving more than 12 inches of precipitation, especially in the pinyon-juniper and mountain brush zones. It is an excellent plant for erosion control because it spreads both vegetatively and by seed and is often used in conservation and windbreak plantings. This shrub requires little maintenance and is frequently used in recreational plantings around campgrounds, roadways, etc. It provides food (berries) and cover for upland game and year-round browse for big game and livestock. It can be established by direct seeding, transplanted seedlings, nursery stock, and wildlings.

Ephedra, green (Native)

This native evergreen species is common on shallow to medium depth sandy or rocky slopes and in valleys of the salt, southern, and higher creosotebush deserts; desert grasslands, Joshua tree, juniper-pinyon, and oak woodlands. It tolerates calcareous, weakly saline, and slightly saline-alkaline sites, and is sometimes in clay soils. It thrives in dry, well-drained sites, usually on sites receiving 8 to 12 inches of precipitation. Green Ephedra does well in a mixture. Fall seeding is recommended. Seed should be covered 1/4 to 1/2 inch deep on a well prepared, firm seedbed. Green ephedra is generally seeded in a mixture to revegetate depleted game ranges in mountain shrub, juniper-pinyon and sagebrush zones. It can stabilize soil erosion and is useful in highway and park beautification. Livestock and big game make extensive use of this species, which provides green browse year-round.

Nevada ephedra (*E. nevadensis*) is a desert species that is more tolerant of soil salinity and drought. It has potential as a forage and in stabilizing valleys and drier sites.

Hopsage, spiney (Native)

Spiney hopsage is normally restricted to heavy textured basic soils. It frequently grows in conjunction with salt desert species, or intermixed with big sagebrush and pinyon-juniper communities. This shrub has not been widely seeded, but few substitute species have been found adapted to sites occupied by this shrub. It is particularly important as early spring forage to wildlife. It is a persistent long-lived shrub that occurs on sites that are important winter/spring ranges for big game. It should be fall planted, in a weed-free seedbed. Seedlings do not survive weedy competition, particularly downy brome grass.

Kochia, forage (Introduced)

Forage kochia is a semi-evergreen perennial subshrub introduced from Southern Eurasia. This valuable forage shrub is often associated with crested wheatgrass and is seeded on semiarid locations in the Western United States as a forage and reclamation plant. This shrub develops a fibrous root system with a large deep tap root and

has been successfully seeded in areas receiving 5 to 27 inches of precipitation.

It is adaptable to the pinyon-juniper, basin big sagebrush, Wyoming big sagebrush, and greasewood-shadscale zones. It can persist on disturbed harsh soils, has high salt and drought tolerance, tolerates extreme temperatures (-25° to 104°F), low oxalate levels (lower than winterfat and fourwing saltbush), spreads rapidly from seed, produces large number of seed, has moderate shade tolerance, is palatable to livestock and big game, provides food and cover for upland game birds, fair fire tolerance, is compatible with other perennials, competes with annuals, and can increase the forage quality of perennial grass stands during the fall and winter. The lower one-third of the plant remains green and succulent year-round. The upper stems and seed stalks turn brown to red and dry after seed shatter (November to December).

In annual communities such as halogeton or downy brome, forage kochia competes with annuals by reducing their dominance, density, forage, and seed production. In perennial communities, this shrub becomes established in unoccupied areas but does not reduce the density of established perennials.

Direct seeding on rangelands is best accomplished in the fall or winter by broadcasting on top of disturbed or undisturbed soil. If drill seeded, seed should not be seeded deeper than 1/16 inch. Seeding can be in combination with other perennial species. One variety, "Immigrant," has been released and is described above. Viability of forage kochia seed may drop very rapidly.

Mountain mahogany, curlleaf and true (Native)

Two species of mountain mahogany are excellent wildland shrubs for several purposes. Curlleaf mountain mahogany (*C. ledifolius*) is an evergreen shrub or small tree up to 23 feet tall. True mountain mahogany (*C. montanus*) is a deciduous shrub generally less than 12 feet tall. Both species commonly grow in rocky, mountainous habitats in shallow soils although they (true mountain mahogany in particular) will also grow in more moist fertile soils of canyon bottoms. Both are valuable browse plants for game animals and livestock. Curlleaf mountain mahogany is mainly browsed in the winter whereas true mountain mahogany is utilized year-round. Both are among the most palatable of shrubs to all classes of browsing animals. However, both species are difficult to establish because their seedlings are vulnerable to herbaceous competition and damage as browsing animals seek them out. "Montane" is a widely adapted variety of true mountain mahogany.

Peachbush, desert (Native)

Desert peachbush occurs throughout the more arid pinyon-juniper, big sagebrush, salt desert shrub, and blackbrush communities. It frequently occupies dry stream banks and gullies where infrequent runoff occurs. It is an upright deciduous shrub that provides important ground cover and wildlife habitat. It is not highly palatable to big game or livestock, but is important to upland gamebirds and small mammals. Fruits form rather large stones or seeds. Germination is often erratic, but small seedlings grow quite rapidly and persist well amid arid conditions. Like many other desert shrubs, this species has not been widely planted but it is an important species that has not been replaced with another plant.

Rabbitbrush, rubber (Native)

Rubber rabbitbrush is a shrub usually 12 to 80 inches high but various forms are available, from dwarf forms to those more than 10 feet tall. Rubber rabbitbrush is composed of numerous subspecies (>20) and shows considerable morphological variation in size, stem, leaf, and flower characteristics. A common plant on plains, valleys, and foothills, rubber rabbitbrush grows best in openings within the sagebrush, juniper-pinyon, and ponderosa pine zones in sandy, gravelly, or clay-alkaline soils. It vigorously invades disturbed sites such as roadcuts and overgrazed rangelands but other plants will dominate as conditions improve. It is an excellent plant for controlling erosion because of its deep roots, heavy litter, and ability to become established on severe sites. It is used to seed mine disturbances, roadways, and big game ranges and does well when seeded with grasses and forbs. The value of rubber rabbitbrush as browse varies greatly between subspecies and populations. In general, the white to grayish subspecies are more palatable to livestock and big game than green subspecies. Some populations have excellent nutritive quality. Rubber rabbitbrush is browsed little in the summer, more in the fall, and heaviest during the winter. Some populations of this species may have potential as a source of industrial chemicals (rubber, resin, etc.). It is often difficult to control established, unwanted stands. Seed should be surface seeded on disturbed seedbeds and not deeper than 1/8 inch.

Rose, Woods (Native)

This species is common in well-drained loamy to sandy soils on plains, foothills, and mountain sites. It tolerates moderately acid to weakly basic but mostly non-saline soils and is most abundant in disturbed soils and open communities with reduced competition. It is an aggressive pioneer in abandoned fields, disturbed sites, gullies, and land cuts and fills, and is common in areas receiving 12 to over 20 inches of precipitation.

FIELD OFFICE TECHNICAL GUIDE: SECTION II-E
LOCATION: MLRA 028A
AREA:
STATE: UTAH

RANGE SITE DESCRIPTION

RANGE SITE NAME: SEMIDESERT SHALLOW LOAM (BLACK SAGEBRUSH)

RANGE SITE NUMBER: 028AY236UT

ORIGINAL DATE: 02/01/1988

REVISION DATE: 06/29/1993

AUTHOR'S INITIALS: DJS

I. SOIL NARRATIVE:

THIS SITE OCCURS ON HILLSIDES, MOUNTAINS, AND TO A LESSER EXTENT ON PEDIMENTS.

THE CHARACTERISTIC SOILS IN THIS SITE ARE 10 TO 20 INCHES DEEP OVER BEDROCK AND WELL DRAINED.

THEY FORMED IN COLLUVIUM AND RESIDUUM DERIVED MAINLY FROM LIMESTONE, SANDSTONE, SILTSTONE, AND BASALT PARENT MATERIALS THE SURFACE HORIZON IS LOAM TEXTURE AND 4 INCHES THICK. ABOUT 55 PERCENT OF THE SOIL SURFACE IS COVERED BY ROCK FRAGMENTS. THE VOLUME OF ROCK FRAGMENTS IN THE SOIL PROFILE IS 35 TO 60 PERCENT.

THE ROCK FRAGMENTS IN THESE SOILS ARE DOMINATED BY PEBBLES IN MOST SOILS, BUT COBBLES AND STONES PREDOMINATE IN SOME SOILS. THESE SOILS ARE CALCAREOUS THROUGHOUT AND PERMEABILITY IS GENERALLY MODERATE. THE AVAILABLE WATER CAPACITY IS 1 TO 3 INCHES.

THE WATER SUPPLYING CAPACITY IS 1 TO 4 INCHES. NATURAL GEOLOGIC EROSION IN POTENTIAL IS APPROXIMATELY 3 TONS/ACRE/YEAR.

THE CLIMATE IS SEMI-ARID AND CHARACTERIZED BY COLD SNOWY WINTERS AND WARM DRY SUMMERS. THE AVERAGE ANNUAL PRECIPITATION IS 8 TO 12 INCHES. APPROXIMATELY 70 PERCENT COMES AS RAIN FROM MARCH THROUGH OCTOBER. ON THE AVERAGE, JUNE THROUGH SEPTEMBER ARE THE DRIEST MONTHS AND MARCH THROUGH MAY ARE THE WETTEST MONTHS.

II. LIST OF SOIL TAXONOMIC UNITS OR SOILS MAPPING UNITS FOR ALL SOILS INCLUDED IN THIS SITE:

CHECKETT GR-L CBV-L
SAXBY FAMILY
SHABLISS VFSL
TARNACH GRV-L
PROMO GRV-L

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III. LANDSCAPE FACTORS

A. PHYSIOGRAPHY:

1. ELEVATION/ASPECT:

LOW 4500 ft / ALL HIGH 6700 ft / ALL

2. PERCENT SLOPE:

LOW 5
HIGH 45

IV. CLIMATE FACTORS

A. FREEZE-FREE PERIOD (FFP): 100 TO 150 (DAYS)

B. FROST-FREE PERIOD: 0 TO 0 (DAYS)

C. MEAN ANNUAL PRECIPITATION (MAP): 8 TO 12 (INCHES)

D. MEAN ANNUAL AIR TEMPERATURE (MAAT): 45 TO 50 (F)

E. MEAN ANNUAL SOIL TEMPERATURE (MAST): 47 TO 52 (F)

F. MOISTURE AND TEMPERATURE DISTRIBUTION:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
- PPT -												
HIGH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	0.85	0.80	0.90	0.96	0.99	0.71	0.79	0.92	0.75	0.78	0.79	0.75
LOW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- TEMP -												
HIGH	39	44	52	61	72	82	90	88	79	67	51	41
MEAN	0	0	0	0	0	0	0	0	0	0	0	0
LOW	13	19	24	30	38	45	53	52	43	32	23	15

V. VEGETATION FACTORS - CLIMAX PLANT COMMUNITY

A. RANGE SITE DESCRIPTION NARRATIVE:

THE DOMINANT ASPECT OF THE PLANT COMMUNITY IS BLACK SAGEBRUSH. THE COMPOSTION BY AIR-DRY WEIGHT IS APPROXIMATELY 45 PERCENT PERENNIAL GRASSES, 5 PERCENT FORBS, AND 50 PERCENT SHRUBS.

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B. PERCENT COVER:

1. GROUND COVER AND STRUCTURE:

	% CANOPY COVER (VERTICAL VIEW)	AVERAGE HEIGHT (FT)	% BASAL AREA COVER
GRASSES AND GRASSLIKES	30	2.00	10
FORBS	3	2.00	2
CRYPTOGAMS	0	0.00	0
SHRUBS	30	2.00	15
TREES	0	0	0

C. Plant community composition and production:

1. Herbaceous

a. Grasses and grasslikes

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
PSSP6	BLUEBUNCH WHEATGRASS	0	20 to 25	0 to 0
ORHY	INDIAN RICEGRASS	0	10 to 15	0 to 0
STCO4	NEEDLEANDTHREAD	0	5 to 10	0 to 0
ELEL5	BOTTLEBRUSH SQUIRRELTAIL	1	1 to 3	3 to 5
HIJA	GALLETA	1	1 to 3	3 to 5
ARPU9	PURPLE THREEAWN	1	1 to 3	3 to 5
POSE	SANDBERG BLUEGRASS	1	1 to 3	3 to 5
PPGG	OTHER PERENNIAL GRASSES	1	3 to 5	3 to 5
AAGG	OTHER ANNUAL GRASSES	1	3 to 5	3 to 5

b. Forbs

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
BAHO	HAIRY BALSAMROOT	2	1 to 3	5 to 10
PHHO	CARPET PHLOX	2	1 to 3	5 to 10
SPGR2	GOOSEBERRYLEAF GLOBEMALLOW	2	1 to 3	5 to 10
EROV	CUSHION WILD BUCKWHEAT	2	1 to 3	5 to 10
PEHU	LOW BEARDTONGUE	2	1 to 3	5 to 10
ERPU2	SHAGGY FLEABANE	2	1 to 3	5 to 10
ASLE8	FRECKLED MILKVETCH	2	1 to 3	5 to 10
IPCOC3	BALLHEAD SKYROCKET	2	1 to 3	5 to 10
SECA2	WOOLLY GROUNDSEL	2	1 to 3	5 to 10
STCO6	HEARTLEAF JEWELFLOWER	2	1 to 3	5 to 10
PPFF	OTHER PERENNIAL FORBS	2	5 to 10	5 to 10
AAFF	OTHER ANNUAL FORBS	2	5 to 10	5 to 10

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2. Shrubs

National Symbol	Common Name	Grp	% Composition by weight	Group % Allowable
ARNO4	BLACK SAGEBRUSH	0	25 to 35	0 to 0
CHVI8	LOW RABBITBRUSH	3	1 to 3	10 to 15
ATCO	SHADSCALE	3	1 to 3	10 to 15
TENU2	NUTTALL HORSEBRUSH	3	1 to 3	10 to 15
EPNE	NEVADA JOINTFIR	3	1 to 3	10 to 15
ARSP5	BUD SAGEBRUSH	3	1 to 3	10 to 15
PUME	MEXICAN CLIFFROSE	3	1 to 3	10 to 15
KRLA2	WINTERFAT	3	1 to 3	10 to 15
GUSA2	BROOM SNAKEWEED	3	1 to 3	10 to 15
STACA	STEMLESS MOCK GOLDENWEED	3	1 to 3	10 to 15
OPPO	CENTRAL PRICKLYPEAR	3	1 to 3	10 to 15
LEPU	GRANITE PRICKLYGILIA	3	1 to 3	10 to 15
SSSS	OTHER SHRUBS	3	10 to 15	10 to 15

5. Production

Grasses and grasslikes: 45 to 55 % of total

Forbs: 5 to 10 % of total

Shrubs: 40 to 50 % of total

Trees: 0 to 0 % of total

Lichen community: 0 lbs/acre (NOT ANNUAL PRODUCTION)

Moss community: 0 lbs/acre

6. Cover

Lichen community: 0 % cover

Moss community: 0 % cover

VI. PLANT GROWTH CURVES

ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NUMBER: UT2361	0	0	5	15	40	30	5	5	0	0	0	0
NAME: PNC												
DESC: EXCELLENT CONDITION												

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I. TOTAL ANNUAL PRODUCTION (EXCELLENT CONDITION)

FAVORABLE	650	TO	700
AVERAGE	500	TO	550
UNFAVORABLE	350	TO	400

IX. PLANT COMMUNITY DYNAMICS:

AS ECOLOGICAL CONDITION DETERIORATES DUE TO OVERGRAZING BLUEBUNCH WHEATGRASS AND INDIAN RICEGRASS DECREASE WHILE BLACK SAGEBRUSH, LOW RABBITBRUSH, AND SNAKEWEED INCREASE.

WHEN THE POTENTIAL NATURAL PLANT COMMUNITY IS BURNED, BLUEBUNCH WHEATGRASS, AND INDIAN RICEGRASS DECREASE WHILE LOW RABBITBRUSH AND SANDBERG BLUEGRASS INCREASE.

CHEATGRASS AND ANNUAL FORBS ARE MOST LIKELY TO INVADE THIS SITE.

X. ASSOCIATED SITES

Sites that occur in association with this site:

SITE NUMBER: 028AY220UT
SITE NAME: SEMIDESERT LOAM (WYOMING BIG SAGEBRUSH)

SITE NUMBER: 028AY234UT
SITE NAME: SEMIDESERT SHALLOW LOAM (UTAH JUNIPER-SALINA WILDRYE)

SITE NUMBER: 028AY230UT
SITE NAME: SEMIDESERT SHALLOW HARDPAN (10-14 PPT)

XII. LIVESTOCK VALUES

THIS SITE IS SUITED FOR CATTLE AND SHEEP GRAZING DURING FALL, WINTER, AND SPRING.

XIII. WOOD PRODUCT VALUES

NONE

XIV. WILDLIFE SPECIES LIST

a. Site factors influencing wildlife species:

THIS SITE PROVIDES FOOD AND LIMITED COVER FOR WILDLIFE.

b. Guide to site use by selected wildlife species:

WILDLIFE USING THIS SITE INCLUDE RABBIT, COYOTE, FOX, BADGER, PRONGHORN ANTELOPE, MULE DEER, AND DOVE.

XV. WATERSHED VALUES

SOILS ARE IN HYDROLOGIC GROUP D WITH RUNOFF CURVES RANGING FROM 80 TO 89 DEPENDING ON HYDROLOGIC CONDITION.

XVI. RECREATION AND NATURAL BEAUTY VALUES

RESOURCES THAT HAVE SPECIAL AESTHETIC AND LANDSCAPE VALUE ARE WILDFLOWERS. SOME RECREATION USES OF THIS SITE ARE HIKING AND HORSEBACK RIDING.

XVII. THREATENED AND ENDANGERED PLANTS

THIS SECTION WILL BE ADDED AS INFORMATION IS AVAILABLE.

XVIII. ARCHAEOLOGICAL VALUES

THIS SECTION WILL BE ADDED AS INFORMATION IS AVAILABLE

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PENDIX I

Reference Data

1. Site Documentation (number and kind of site inventory records)

0	SCS-ECS-5	50	STATE-ECS-FORM
0	SCS-RANGE-417	0	BLM FORM
0	OTHER		

2. Distribution and extent.

County	State
LOGAN FO	UTAH
PROVO FO	UTAH
CEDAR CITY FO	UTAH
MIDVALE FO	UTAH
RICHFIELD FO	UTAH

3. Location of typical example of this site.

BOX ELDER COUNTY UTAH RED DOME ALLOTMENT, HORSE HILLS PHOTO NUMBER 167 F-6. T. 10 N. R. 14 W. SOUTH 1/2 SECTION 12

Approved by: Pat L. Shaver 8/30/93
STATE RANGE CONSERVATIONIST
SCS UTAH

Approved by: Larry D. Butler
WNTC RANGE CONSERVATIONIST
SCS WNTC, PORTLAND, OR

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APPENDIX II

1. Soil taxonomic unit representative of this site:

   Soil Taxon

   CHECKETT GR-L CBV-L

   Soil Survey Area Number

   634

   Taxonomic Classification

   LOAMY-SKELETAL, MIXED, MESIC LITHIC XEROLLIC HAPLARGIDS

2. Type location for soils taxonomic unit representative of this site:

   S 1/2 SEC. 12 T 10 N R 14 W

3. Listing of soils correlated to this site:

Soil Taxon....: TARNACH GRV-L
SSA.....: 611
Classification: LOAMY-SKELETAL, MIXED MESIC LITHIC XEROLLIC CALCIORTHIDS

Soil Taxon....: SAXBY FAMILY
SSA.....: 617
Classification: LOAMY-SKELETAL, MIXED MESIC LITHIC XEROLLIC CALCIORTHIDS

Soil Taxon....: PROMO GRV-L
SSA.....: 601
Classification: LO-SK, MIXED, (CAL) MESIC LITHIC XERIC TORRIORTHENTS

Soil Taxon....: SHABLISS VFSL
SSA.....: 608
Classification: LOAMY, MIXED, MESIC SHALLOW HAPLOXEROLLIC DURORTHIDS

RECEIVED
JUN 30 1994
DIV. OF OIL, GAS & MINING

ML 982
ML 43854
Sec 35 T22S R6W SLB+M

S/027/053

8-28-90